

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



A72  
M342I  
1963

AD-33 Bookplate  
(5-61)

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
LIBRARY



BOOK NUMBER  
22880

A72  
M342I  
1963

# INTERNATIONAL

# CALIBRATION

# COTTON

# STANDARDS

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

MAR 27 1963

C & R-PREP.

SPONSORING ORGANIZATIONS:

American Textile Manufacturers Institute  
American Cotton Shippers Association  
International Federation of Cotton and Allied  
Textile Industries  
National Cotton Council of America  
United States Department of Agriculture

INTERNATIONAL CALIBRATION COTTON STANDARDS COMMITTEE:

Mr. John Wigington, American Textile Manufacturers Institute,  
Clemson, South Carolina (ATMI)  
Dr. Earl E. Berkley, Deering-Milliken Service Corporation,  
Spartanburg, South Carolina (ATMI)  
Mr. S. C. Mayne, Jr., Anderson, Clayton & Co., Houston, Texas (ACSA)  
Mr. J. M. Leahy, Volkart Brothers, Inc., Dallas, Texas (ACSA)  
Mr. Edmund Lord, Shirley Institute, Didsbury, England (IFCATI)  
Mr. Fritz Hadwich, Bremer Baumwollborse, Bremen, Germany (IFCATI)  
Dr. Burt Johnson, National Cotton Council of America, Memphis,  
Tennessee (NCC)  
Mr. J. Ritchie Smith, National Cotton Council of America, Memphis,  
Tennessee (NCC)  
Mr. Stanley C. Rademaker, Agricultural Marketing Service, U. S.  
Department of Agriculture, Washington, D. C. (USDA)  
Mr. William H. Fortenberry, Agricultural Marketing Service, U. S.  
Department of Agriculture, Washington, D. C. (USDA)

OFFICERS OF THE COMMITTEE:

Dr. Burt Johnson, Chairman  
Mr. William H. Fortenberry, Secretary

Revised January 1963

C O N T E N T S

- I PREAMBLE
- II PURPOSE, SCOPE AND ORGANIZATION
  - 1. Purpose
  - 2. Scope
  - 3. Organization
    - a. Sponsors
    - b. International Calibration Cotton Standards Committee
    - c. Responsibilities and Operating Procedures of the Committee
- III OPERATING PLANS
  - 1. Execution of Program by U. S. Department of Agriculture
  - 2. Designation of Sponsors' Laboratories
- IV INTERNATIONAL CALIBRATION COTTON STANDARDS
  - 1. Range of Current Calibration Cotton Standards
  - 2. Preparation of Calibration Cotton Standards
  - 3. Selection of Samples for Establishing Standard Values
  - 4. Determination of Standard Test Values
  - 5. Identification of Calibration Cotton Standards
  - 6. Replacement of Calibration Cottons
  - 7. Addition of Other Types of Cotton to Program
  - 8. Prices and Distribution of Calibration Cotton Standards
  - 9. Instructions for Use of Calibration Cotton Standards
- V SEMI-ANNUAL CHECK TESTS
- VI TERMINATION
- VII OTHER



## I PREAMBLE

The operating details established for providing and maintaining International Calibration Cotton Standards were initially approved by representatives of the sponsoring organizations in October and November, 1956. Distribution of calibration cotton standards and check test samples to laboratories began in February, 1957. During subsequent years, laboratories in more than 40 countries have made increasing use of the calibration cotton standards to calibrate certain of their cotton testing instruments and standardize their test results. This publication is a description of the program as it is currently operated. The amendments which have been made since the 1960 publication arise either from experience gained by the committee or from minor organizational changes.

## II PURPOSE, SCOPE AND ORGANIZATION

### 1. Purpose

The main purpose of this program is to provide calibration cottons by the use of which any cotton laboratory can standardize (a) the level of performance of instruments measuring specified fiber characteristics, or (b) the test levels of operators by adjustment of the results according to values obtained from concurrent tests on the calibration cottons. Such use of these calibration cottons will facilitate a more precise evaluation of raw cotton and thereby be advantageous in both international trade and in the cotton manufacturing industries of all countries.

### 2. Scope

The principal function of the International Calibration Cotton Standards Program is to make available calibration cotton standards on which standard test values have been established for various fiber properties as herein provided. By use of these cottons a fiber laboratory can obtain a standard level of performance by its instruments by:

- a - Direct calibration or mechanical adjustment of its instruments and auxillary equipment; or
- b - Bringing its level of testing to a standard level either by controlling the performance of operators or by applying adjustment factors to test values on the basis of control tests carried out simultaneously on the calibration cottons.



This program includes furnishing calibration cotton standards for which standard test values have been established for (1) fineness as measured by air-flow instruments, and (2) fiber tensile strength as measured at a nominal zero gauge or test length on flat bundles of fibers. Cottons for the calibration of instruments measuring fiber properties other than those now measured shall be adopted and included in the program only when (1) the sponsors of the program request that additional fiber properties be tested, and (2) the proposed method of test has been fully investigated, standardized, and the results found to be reproducible.

A secondary function of the International Calibration Cotton Standards Program is periodically to provide purchasers of calibration cottons with unknown check samples of cotton for testing. These "check test samples" are tested by the participating laboratories and the results reported to the USDA. The purposes of the check test program are (a) to provide a means of evaluating the effectiveness of the calibration program in establishing a uniform level of testing; (b) to provide statistical data for estimating various aspects of test reproducibility; and (c) to assist individual laboratories in maintaining their operation on a level equal to the average of all laboratories.

### 3. Organization

#### a - Sponsors

The International Calibration Cotton Standards Program is sponsored by the following organizations:

American Textile Manufacturers Institute (ATMI)  
American Cotton Shippers Association (ACSA)  
International Federation of Cotton and Allied  
Textile Industries (IFCATI)  
National Cotton Council of America (NCC)  
United States Department of Agriculture (USDA)

#### b - International Calibration Cotton Standards Committee

- (1) The committee is composed of two representatives of each of the sponsoring organizations. Such representatives are designated in writing by the heads of the respective organizations.
- (2) A chairman and secretary are elected by majority vote of the committee for a period of approximately two years or until the next called meeting of the

committee, whichever is the longer period. If an elected officer is replaced on the committee by his respective organization before his term is completed, the successor to his office will be elected at the next called meeting of the committee. An officer may be reelected to serve additional terms.

- (3) Each sponsoring organization has two votes which may be cast by (a) its appointed members to the committee, (b) by proxy of its appointed members, or (c) by deputy delegates designated by the sponsoring organizations.

c - Responsibilities and Operating Procedures of the Committee

- (1) The committee is responsible for establishing the operational framework within which the calibration cotton standards program is conducted by the USDA, and for maintaining the program in accordance with the general policy outlined in this publication.
- (2) Actions relating to major matters of purpose and scope are based on the unanimous vote of all representatives of the sponsoring organizations, but decision on minor matters of procedural detail may be taken on a majority vote. If there is any doubt whether an action under consideration is a major matter requiring a unanimous vote of all representatives of the sponsoring organizations or a minor matter requiring only a majority vote, the matter is decided by the chairman of the committee.
- (3) The chairman calls meetings of the committee.
- (4) Draft agendas for meetings are furnished by the secretary to committee members and heads of sponsoring organizations in ample time for them to prepare their comments and suggestions in advance of date of meeting.
- (5) A draft copy of minutes of meetings is submitted to all committee members for approval or correction promptly after each meeting.
- (6) Copies of the approved minutes of meetings are furnished to committee members and heads of the sponsoring organizations.

- (7) The secretary prepares a short progress report on the operation of the program each year ending June 30. Copies of this report are distributed to heads of sponsoring organizations, committee members, and participating laboratories.
- (8) Material in the approved minutes of meetings, check test reports, progress reports, and other releases pertaining to this program may be distributed to their members by any of the sponsoring organizations as they may desire.
- (9) Copies of all news releases pertaining to this program made by any of the sponsoring organizations are forwarded to the heads of the other organizations and the secretary of the committee.
- (10) Other responsibilities are assumed by the committee as the program may be expanded or formally amended.

### III OPERATING PLANS

#### 1. Execution of Program by U. S. Department of Agriculture

The Cotton Division, Agricultural Marketing Service, U. S. Department of Agriculture, in behalf of the committee and sponsors, operates the program in accordance with policies outlined in Sections IV and V of this publication or as modified by the International Calibration Cotton Standards Committee as explained in Section II - 3b. The USDA may use its discretion in conducting day-to-day operations in behalf of the committee and the sponsoring organizations. Details of how the calibration cottons are prepared and distributed are given in Section IV. Procedures for conducting the semi-annual check tests by the USDA are given in Section V.

#### 2. Designation of Sponsors' Laboratories

Laboratories which are to determine standard test values for the calibration cottons referred to in Section II - 2 are designated in writing by the respective sponsoring organizations listed in Section II - 3a. The ATMI, ASCA, NCC and USDA may each designate one laboratory for this purpose. The IFCATI may designate two such laboratories. All such laboratories are referred to as "designated laboratories." If and when additional organizations sponsor this program, each may also designate a laboratory. The designated laboratories of the current sponsoring organizations are as follows:



- a American Textile Manufacturers Institute,  
Clemson, South Carolina (ATMI)
- b U. S. Testing Company, Memphis, Tennessee (ACSA)
- c Shirley Institute, Manchester, England (IFCATI)
- d Bremen Cotton Exchange, Bremen, Germany (IFCATI)
- e U. S. Department of Agriculture, Washington, D. C.  
(USDA)

#### IV INTERNATIONAL CALIBRATION COTTON STANDARDS

##### 1. Range of Current Calibration Cottons

The calibration cottons to be made available under this program will eventually cover the entire scale of Micronaire values and an adequate range of values for fiber flat bundle strength at zero gauge spacing. Nine calibration cotton standards are currently (1962) available. The nine standards consist of six American Upland, one Asiatic, one Egyptian, and one American-Egyptian cotton. The American Upland calibration cottons range in Micronaire value from 2.61 to 6.22 and in fiber strength from 69,900 to 89,400 pounds per square inch. The Asiatic standard has a Micronaire value of 7.08 and a strength of 75,000 pounds. The Egyptian and American-Egyptian cottons range from 2.83 to 3.74 in Micronaire value and from 92,600 to 98,400 pounds in strength.

The current calibration cotton standards and their established test values are shown in the following table:

| International<br>Calibration<br>Cotton<br>Standards | Description       | Established test values |                                       |                   |              |  |
|---|-------------------|-------------------------|---------------------------------------|-------------------|--------------|--|
|   |                   | Micronaire<br>reading   | Pressley fiber strength<br>zero gauge |                   |              |  |
|   |                   |                         | Ratio                                 | Grams<br>per tex: | 1,000<br>PSI |  |
| A-2   | American Upland   | 5.54                    | 7.16                                  | 38.4              | 77,300       |  |
| B-4   | American Upland   | 4.43                    | 7.15                                  | 38.3              | 77,200       |  |
| C-3   | American Upland   | 3.45                    | 7.92                                  | 42.5              | 85,500       |  |
| D   | Egyptian          | 3.74                    | 9.11                                  | 48.8              | 98,400       |  |
| E   | American-Egyptian | 2.83                    | 8.58                                  | 46.0              | 92,600       |  |
| F   | Asiatic           | 7.08                    | 7.00                                  | 37.5              | 75,600       |  |
| G   | American Upland   | 2.61                    | 6.48                                  | 34.7              | 69,900       |  |
| H   | American Upland   | 6.22                    | 8.28                                  | 44.4              | 89,400       |  |
| I   | American Upland   | 4.91                    | 7.44                                  | 39.9              | 80,300       |  |

## 2. Preparation of Calibration Cotton Standards

The following procedures are followed in blending and processing into card web each bale selected for use as a calibration cotton unless modifications are required because of the physical characteristics of a specific cotton:

- a - The bale bands are removed which allows bale to expand.
- b - The bale is divided into 16 piles of equal quantities, with each layer removed making part of each of the 16 piles.
- c - Each pile is opened by hand and allowed to condition for one day.
- d - Each of the 16 piles is processed through a picker to make 16 breaker laps.
- e - The 16 breaker laps are divided into four groups with every fourth lap going into the same group. Each group is fed to the picker (4 doublings). Sixteen intermediate laps are produced from the four groups.
- f - The 16 intermediate laps are divided into four groups with every fourth lap going into a group. Each group is fed to the picker (4 doublings). Sixteen finisher laps are produced from the four groups.
- g - Each of the 16 finisher laps is fed to the card to produce card web at the following rates of carding:
  - (1) 12-1/2 pounds per hour for cottons 15/16-inch and shorter in staple length.
  - (2) 9-1/2 pounds per hour for cottons 31/32-inch through 1-1/16 inches in staple length.
  - (3) 6-1/2 pounds per hour for cottons 1-3/32 inches through 1-1/4 inches in staple length.
  - (4) 4-1/2 pounds per hour for cottons 1-9/32 inches and longer in staple length.
- h - The card web is not pieced up to card calender rolls, but is allowed to accumulate between doffer comb and calender rolls.

- i - The card web is removed as it accumulates and is placed in clean bags.
- j - Bags of card web are shipped to the Washington office for eventual packaging (by means of the equipment used for packaging staple standards) into 1/2-pound packages and labeling.

### 3. Selection of Samples for Establishing Standard Values

After the bulk card web arrives in Washington from the processing laboratory, 10 large samples are selected at random representing the entire bale. Each of the 10 large samples selected to be tested for each proposed calibration cotton is subdivided into 5 sub-samples to provide a group of 10 sub-samples for testing by each of the five designated laboratories. This method of selecting test samples for establishing standard values is used for candidate replacement bales and for candidate bales for expanding the range of fiber values in the program.

### 4. Determination of Standard Test Values

In establishing standard values for the calibration cottons, samples of three current calibration cottons and the group of 10 sub-samples representing the candidate bale are sent to each designated laboratory. Three individual air-flow measurements for fineness and six fiber strength determinations are made by each designated laboratory in accordance with either ASTM or ISO standard procedure, whichever is applicable, on each of the 10 sub-samples.

An adequate number of tests is made by each designated laboratory on the three specified calibration cotton samples prior to or concurrent with the testing of the group of 10 sub-samples representing the candidate bale to determine its suitability for calibration purposes. If the three calibration samples are tested prior to testing the candidate material and the results are on the correct level, the laboratory then proceeds to test the 10 sub-samples representing the candidate bale. On the other hand, if the test results on the three specified calibration samples are not on the proper level, further adjustment of instruments and technique is made before tests are performed on the sub-samples representing the candidate bale. Laboratories preferring to test the three calibration cottons concurrently with the 10 sub-samples of the candidate bale adjust the results obtained on the candidate material according to the deviations of actual test results for the three calibration cottons from their recognized standard values.



Three Micronaire readings and six fiber strength measurements on each of the 10 sub-samples make a total of 30 air-flow and 60 fiber strength determinations per candidate bale for each laboratory. The standard test values are the arithmetic averages of the average values obtained by the designated laboratories. Thus, a total of 150 Micronaire readings and 300 fiber strength measurements per candidate bale are involved in arriving at the respective standard test values.

The results reported by the designated laboratories on a candidate bale are tabulated and averaged. Copies of the tabulation showing the average results for each of the five laboratories, the average of all laboratories, the range between laboratories and a statistical analysis of the individual test data are furnished to members of the committee for their approval before a candidate bale is released as either a new or replacement calibration cotton standard.

The approved grand averages are the values shown on the label of each package of calibration cotton made from the candidate bale. The standard Micronaire values and fiber strength-weight-ratio values are carried to two decimal places, whereas fiber strength values expressed as grams per tex are carried to one decimal place. Strength, as psi, is rounded off to the nearest 100 pounds. In order for a candidate bale to be approved by the committee as a calibration cotton, the average values for each of the designated laboratories must agree with the average value obtained by all five laboratories within a tolerance of + .10 Micronaire reading and + .20 Pressley strength-weight-ratio.

The committee points out that, in testing samples of commercial lots of cotton and in contracts specifying the requirements to be met by such test values, it should not be interpreted that test values should be recorded to the precision demanded above or that tolerances should be as narrow as those adopted for ensuring agreements between the average value furnished by the five designated laboratories. The variability within a single bale and between bales in a shipment is far greater than that within sub-samples and between sub-samples of any calibration or check test cotton. Furthermore, the amount of work undertaken for establishing standard values for each calibration cotton greatly exceeds the limited testing performed on all commercial samples of raw cotton.

##### 5. Identification of International Calibration Cottons

- a - The calibration cottons are identified by letters in alphabetical order. The cottons currently available are

identified as calibration cottons A-2, B-3, C-2, D, E, F, G, H, and I. As additional cottons are added to the program to cover wider ranges of a given property or to test additional fiber properties, they will be identified consecutively with the next letter in the alphabet. When the range of standards has been sufficiently extended, the committee may agree to classify the calibration cottons into groups, possibly according to type, origin or measured characteristics, or adopt some other appropriate system of identification.

- b - Each package of a standard calibration cotton is labeled as illustrated in figure 1. All packages of each standard are numbered consecutively, starting with sample No. 1. The labeling of samples for replacement bales for previous comparable calibration cottons is described in Section IV-6.

#### 6. Replacement of Calibration Cotton Standards

When the supply of any calibration cotton standard is depleted, a replacement cotton is made available. Insofar as is practicable, the replacement in each instance is similar to but not necessarily an exact duplicate of fiber characteristics of the cotton being replaced. The replacement, however, is so identified as to distinguish it from the cotton being replaced.

The first replacement bale for each of the calibration cottons has the numeral 2 placed after the identification letter of the calibration cotton. For example, when cotton from the original bale of calibration cotton A was depleted, the cotton packaged from the replacement bale was identified as calibration cotton A-2. The second replacement bale will be identified as calibration cotton A-3, with each replacement bale thereafter being assigned the next consecutive number. The samples packaged from the replacement bale are assigned consecutive numbers starting with sample No. 1.

#### 7. Addition of Other Types of Cotton to the Program

Other types of cotton will be established as calibration cotton standards if and when the sponsoring organizations determine they are needed in the program. The selection, blending, processing, packaging, labeling, determination of standard test values, distribution, and replacement of such additional types of cotton will be performed in accordance with the procedures outlined in the foregoing.

INTERNATIONAL  
CALIBRATION COTTON

Prepared and distributed by the  
COTTON DIVISION  
AGRICULTURAL MARKETING SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE

Tested in accordance with standard procedures of  
THE AMERICAN SOCIETY FOR TESTING MATERIALS  
CALIBRATION COTTON

INTERNATIONAL  
CALIBRATION COTTON

Prepared and distributed by the  
COTTON DIVISION  
AGRICULTURAL MARKETING SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE

Tested in accordance with standard procedures of  
THE AMERICAN SOCIETY FOR TESTING MATERIALS

CALIBRATION COTTON B-3 SAMPLE NO. 1105

AIR FLOW MEASUREMENT 4.46 MICRONAIRE READING 1/

FIBER STRENGTH (Pressley flat bundle 0 gauge)

Strength-weight-ratio : 7.38

Grams per tex : 39.6

Pounds per square inch: 79,700

1/ Based on USDA Upland Curvilinear Scale

SPONSORED BY :

THE AMERICAN COTTON MANUFACTURERS INSTITUTE  
THE AMERICAN COTTON SHIPPERS ASSOCIATION  
THE INTERNATIONAL FEDERATION OF COTTON AND  
ALLIED TEXTILE INDUSTRIES  
THE NATIONAL COTTON COUNCIL OF AMERICA  
THE UNITED STATES DEPARTMENT OF AGRICULTURE

Figure 1



## 8. Prices and Distribution of Calibration Standards

The USDA establishes prices for calibration cotton standards which, insofar as is practicable, cover costs of their procurement, processing, distribution and related services. Form CN-62 -- Application for Ordering Calibration Cotton Standards -- may be obtained from the Cotton Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C., U. S. A. This form shows the standards available, their established test values and delivered prices. The current price per 1/2-pound package of any one of the calibration cotton standards is \$5.00. This price includes prepaid shipment by surface parcel post. For shipment by air parcel post the price per 1/2-pound package is \$5.50 for destinations within the United States and \$6.00 for other destinations.

## 9. Instructions for Use of Calibration Cotton Standards

Detailed instructions with respect to the use of calibration cotton standards for calibrating Micronaire and Pressley instruments are furnished with each new order filled.

## V SEMI-ANNUAL CHECK TESTS

Semi-annual check tests are conducted by the Cotton Division, AMS, USDA, for the International Calibration Cotton Standards Committee. Check test samples are available to any laboratory that purchases calibration cottons. When calibration cottons are purchased for the first time, the purchasing laboratory is requested to notify the Cotton Division, AMS, USDA, if it is interested in receiving check test samples for testing on a semi-annual basis. Those laboratories expressing a desire to participate are furnished free of any charge two unknown samples of blended cotton every six months for testing. The participating laboratory tests the two check test samples according to instructions furnished with the samples and forwards the test results to the USDA for statistical analysis. The Cotton Division, AMS, USDA, reports the results of the semi-annual check test to participating laboratories. The report is comprised of a tabulation showing the average of each laboratory opposite its code number, the range of results, the average for the designated laboratories, the average of all laboratories, the range between the upper and lower tolerances, and the number and percentage of laboratories within tolerance. The standard deviation of results reported by the designated laboratories is also included in the report. All laboratories reporting results within plus or minus .10 Micronaire reading and plus or minus .20 Pressley zero gauge strength-weight-ratio (1.2 g/tex) of the average value established on each check test sample by the designated laboratories are considered

as being within acceptable limits of laboratory performance. At the discretion of the United States Department of Agriculture, check test samples may be withheld from laboratories failing to return results for the two preceding semi-annual check tests.

## VI TERMINATION

These procedures will continue in force under the mutual agreement of the sponsoring organizations. However, any organization may withdraw as a sponsor by giving written notice to the other organizations 60 days in advance of and specifying the effective date of its withdrawal.

## VII OTHER

The responsibilities assumed by the U. S. Department of Agriculture, as outlined in the above procedures, are contingent upon funds being made available from which expenditures may legally be made.

### APPROVED:

For the American Textile Manufacturers Institute:

John T. Wigginton  
Earl E. Berkey

Date Dec 19, 1962

Dec 20 1962

For the American Cotton Shippers Association:

John M. Mayne, Jr.  
John M. Leach

Jan. 3, 1963

Jan 4 1963

For the International Federation of Cotton and Allied Textile Industries:

Mario Ludwig, Director.

15th November 1962

For the National Cotton Council of America:

Conrad A. Buckner  
J. Ritchie Smith

Nov. 26 1962

Dec. 4, 1962

For the United States Department of Agriculture:

Stanley C. Rademaker  
William H. Fortenberry

6 NOV 1962

6 Nov. 1962







